

WHAT IS CLAIMED IS:

1. An adenoviral vector for the selective expression of toxin gene in cancer cell, comprising a toxin gene operably linked to a promoter of a gene with undetectable expression in liver, wherein the expression of said toxin gene is reduced in liver cells.

2. The adenoviral vector of claim 1, wherein said promoter is cyclooxygenase-2 promoter.

3. The adenoviral vector of claim 2, wherein said cyclooxygenase-2 promoter is selected from the group consisting of cyclooxygenase-2 L (-1432/+59) and cyclooxygenase-2 M (-833/+59).

4. The adenoviral vector of claim 1, wherein said cancer cell is selected from the group consisting of gastrointestinal cancer cell and pancreatic cancer cell.

5. The adenoviral vector of claim 1, wherein said toxin gene is selected from the group consisting of the herpes simplex virus thymidine kinase gene, the cytosine deaminase gene and the purine nucleoside phosphorylase gene.

6. The adenoviral vector of claim 1, further comprises a RGD motif in the HI loop of the adenovirus fiber protein.

7. A method of killing tumor cells with reduced liver toxicity in an individual, comprising the step of:

administering a therapeutically effective amount of adenoviral vector comprising a toxin gene operably linked to a promoter of a gene with undetectable expression in liver, wherein expression of said toxin gene is reduced in liver cells and expression of said toxin gene in tumor cells results in killing of said tumor cells.

8. The method of claim 7, wherein said administering is by intravenous injection.

5 9. The method of claim 7, wherein said tumor cells are selected from the group consisting of gastrointestinal cancer cells and pancreatic cancer cells.

10 10. The method of claim 7, wherein said promoter is cyclooxygenase-2 promoter.

15 11. The method of claim 10, wherein said cyclooxygenase-2 promoter is selected from the group consisting of cyclooxygenase-2 L (-1432/+59) and cyclooxygenase-2 M (-833/+59).

20 12. The method of claim 7, wherein said toxin gene is selected from the group consisting of the herpes simplex virus

thymidine kinase gene, the cytosine deaminase gene and the purine nucleoside phosphorylase gene.

5

13. The method of claim 7, wherein said toxin gene is the herpes simplex virus thymidine kinase gene, and further comprises a step of treating said individual with ganciclovir.

10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
205
210
215
220
225
230
235
240
245
250
255
260
265
270
275
280
285
290
295
300
305
310
315
320
325
330
335
340
345
350
355
360
365
370
375
380
385
390
395
400
405
410
415
420
425
430
435
440
445
450
455
460
465
470
475
480
485
490
495
500
505
510
515
520
525
530
535
540
545
550
555
560
565
570
575
580
585
590
595
600
605
610
615
620
625
630
635
640
645
650
655
660
665
670
675
680
685
690
695
700
705
710
715
720
725
730
735
740
745
750
755
760
765
770
775
780
785
790
795
800
805
810
815
820
825
830
835
840
845
850
855
860
865
870
875
880
885
890
895
900
905
910
915
920
925
930
935
940
945
950
955
960
965
970
975
980
985
990
995

14. The method of claim 7, wherein said adenoviral vector further comprises a RGD motif in the HI loop of the adenovirus fiber protein.